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ABSTRACT

A study was conducted to determine whether DeKalb Technical School's developmental studies students were as successful as other students who took more conventional routes of matriculation. The study was limited to 449 students who posted grades in developmental studies and/or in specified common content courses in Reading, English and Mathematics from February 1983 to February 1985. Study findings included the following: (1) the success rates of developmental studies students compared favorably to those of regular students in English courses; but (2) in mathematics courses, students who met testing requirements and entered their programs had higher success rates than developmental studies students. Recommendations concerning the college's Special Services Department and research needs are included. (LAL)

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# Success Rate Comparisons
# for
# DeKalb Tech
# Developmental Studies Students

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"Success Rate Comparisons for DeKalb Tech Developmental Studies Students"

## Abstract

The study sought to determine whether DeKalb Technical School's Developmental Studies students were as successful as other students who took more conventional routes of matriculation. The study was limited to 449 students who posted grades in Developmental Studies and/or in specified common content courses germane to Reading, English, and Mathematics from February 1983 to February 1985. The Chi Square statistic was used with an 80% level of expectation set by DeKalb Tech's Special Services Department. Eight specific success rate comparisons were made for three designated groups at DeKalb Tech.

The findings show that Developmental Studies students' success rate compares favorably to the success rate of other students in English courses. However, there is a significant difference between the success rates of Developmental Studies students and regular students (noted as those who initially complete the REM Test requirement) in Mathematics courses. This Mathematics course success rate difference was also found between regular students and students who completed the Stanford Diagnostic Test (an alternate program entry instrument), and confirms the REM Test as a valid predictor of student success in Mathematics courses.

Accordingly, recommendations included better feedback from program level Mathematics, upgrading of Developmental Studies Mathematics course requirements, and the consideration of concurrent enrollment for some students.

The purpose of this study was to compare Developmental Studies students with regular students in some of their program level courses at DeKalb Technical School. Instructors in DeKalb Tech's Special Services Department requested the study out of concerns about whether their Developmental Studies students were as successful as those who took other routes of matriculation. In their request to The Office of Research and Planning, the instructors noted that scientific comparisons of post-Developmental Studies results could provide guidelines for program improvement, and generate elements for student retention, growth, and development.

## Statement of The Problem

DeKalb Tech's 36 vocational-technical programs experience three types of enrolled students:

1. One-step enrollees: students who complete the DeKalb REM Admissions-Placement Test requirement and enter a program.

2. Two-step enrollees: students who do not complete the REM Test requirement, but who post adequate scores on the Stanford Diagnostic Test, and then enter a program.

3. Three-step enrollees: students who do not complete the REM Test requirement, who post inadequate scores on the Stanford Diagnostic Test, but who complete Developmental Studies requirements, and then enter a program.

Since some programs require higher REM Test scores than others, a student's program choice often determines whether the student becomes a One-step, Two-step, or Three-step enrollee.

Subsequently, all enrollees enter programs with widely varying course requirements. This variety enhances student choices, but it confuses efforts to compare student success. Despite the fact that Boylan (1983) and others have substantiated the worth of Developmental Studies, empirical evidence is needed to compare the success rate of Developmental Studies students with the success rate of regular students. Such comparisons can aid the instructional process and pin-point areas where coursework should be better emphasized.

## Basic Question and Limitations

The basic question of the study was: How does the success rate of students who complete Developmental Studies compare with the success rate of those who do not take Developmental Studies? The study was limited to Reading, English, and Mathematics course success rates of DeKalb Tech students enrolled from February 1983 to February 1985 who posted grades in Developmental Studies and/or in the following common content courses:

| English | Mathematics |
|---|---|
| BA 108 Business English | ESP 101 Mathematics I |
| ESP 115 Communication Skills | BA 105 Business Mathematics |
| ENG 109 English and Composition | CGY 101 Mathematics I |
| | GAT 108 Basic Mathematics |
| | GAT 125 Mathematics for Printers |
| | MTO 113 Mathematics I |

## Review of the Literature

There is early precedent for comparing DeKalb Tech students. Gray (1974) compared Data Processing students enrolled at DeKalb Tech from 1962-1971. His purpose was to identify and analyze selected variables in order to produce guidelines for counseling

prospective students. He concluded that scores generated from diagnostic tests were valid predictors of success in the Data Processing Program, but the tests were not reliable enough to determine whether a student is ready for acceptance into the Program.

Fadale (1977) concluded that environmental and background characteristics of students are less significant than what is generally believed. The study focused on six New York State colleges which had Developmental Studies for occupational students. Variables used in evaluating student success included: (1) scores on The Inventory of Personal Values and The Inventory of Non-Personal Values, (2) faculty predictions, (3) reading scores, (4) rating of will and motivation, (5) rating of goal orientation and program impact, and (6) a questionnaire developed from faculty expectations. Reading scores and faculty predictions were found to be most highly correlated with student success.

Bergman and Gerace (1974) compared the grades of Developmental Studies students and regular students in some of their subsequent English courses at Queensborough Community College. They compared 2,000 Freshman students of each kind to find that there was a comparable percentage of passing grades. Replication of the study the following year with a different Freshman population produced similar results.

It appears that for various reasons educators are anxious to compare the success of Developmental Studies students with the success of regular students. However, the variables deemed most important vary, and mandate comparisons peculiar to each institution's areas

of emphasis. Prominent among these areas are the diagnostic tools used for program entry, the Developmental Studies curriculum, and instructor encouragement in critical courses such as English and Mathematics.

## Methodology

The population of the study was 449 students who posted grades in Developmental Studies and/or in the selected common content courses. The Administrative Computing Center provided information that noted 227 as One-step enrollees, 133 as Two-step enrollees, and 89 as Three-step enrollees. The enrollees were respectively labeled Group 1, Group 2, and Group 3. English and Mathematics letter grades were recovered for each student, and it was determined that recorded grades of A through D were successful, while other recorded grades were unsuccessful. The Chi Square statistic was used to make the comparisons, and an 80% level of expectation was set by the Special Services Department. The basic question of the study referred to eight specific comparisons:

1. Between One-step and Multi-step enrollees in English.
2. Between One-step and Two-step enrollees in English.
3. Between One-step and Three-step enrollees in English.
4. Between Two-step and Three-step enrollees in English.
5. Between One-step and Multi-step enrollees in Mathematics.
6. Between One-step and Two-step enrollees in Mathematics.
7. Between One-step and Three-step enrollees in Mathematics.
8. Between Two-step and Three-step enrollees in Mathematics.

## Results and Discussion

The eight comparisons generated eight null hypotheses, and Chi Square Tables with a .05 level of significance, 1 degree of freedom, and a critical value of 3.84.

Null Hypothesis No. 1: There is no significant difference between the success rate of One-step and Multi-step enrollees in English courses.

Table 1 - English Comparisons Between One-Step and Multi-Step Enrollees

| Group | Observed | Expected | O-E | $(O-E)^2$ | $(O-E)^2/E$ |
|---|---|---|---|---|---|
| Group 1 | 169 | 150.40 | 18.60 | 345.96 | 2.30 |
| Groups 2&3 | 73 | 71.20 | 1.80 | 3.24 | .05 |
| N=277 (Group 1 = 188, Groups 2 & 3 = 89) | | | | | 2.35 |
| | | | | Chi Square = | 2.35 |

No. 1 Results: Failed to reject the null hypothesis. There is no significant difference between the success rate of One-step and Multi-step enrollees in English courses.

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Null Hypothesis No. 2: There is no significant difference between the success rate of One-step and Two-step enrollees in English courses.

Table 2 - English Comparisons Between One-Step And Two-Step Enrollees

| Group | Observed | Expected | O-E | $(O-E)^2$ | $(O-E)^2/E$ |
|---|---|---|---|---|---|
| Group 1 | 169 | 150.40 | 18.60 | 345.96 | 2.30 |
| Group 2 | 36 | 36.00 | .00 | .00 | .00 |
| N=233 (Group 1 = 188, Group 2 = 45) | | | | | 2.30 |
| | | | | Chi Square = | 2.30 |

No. 2 Results: Failed to reject the null hypothesis. There is no significant difference between the success rate of One-step and Two-step enrollees in English courses.

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Null Hypothesis No. 3: There is no significant difference between the success rate of One-step and Three-step enrollees in English courses.

Table 3 - English Comparisons Between One-Step and Three-Step Enrollees

| Group 1 | Observed | Expected | O-E | $(O-E)^2$ | $(O-E)^2/E$ |
|---|---|---|---|---|---|
| Group 1 | 169 | 150.40 | 18.60 | 345.96 | 2.30 |
| Group 3 | 37 | 35.00 | 180.00 | 3.24 | .09 |
| N = 232 (Group 1 = 188, Group 3 = 44) | | | | | 2.39 |
| | | | | Chi Square = | 2.39 |

No. 3 Results: Failed to reject the null hypothesis. There is no significant difference between the sucess rate of One-step and Three-step enrollees in English courses.

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Null Hypothesis No. 4: There is no significant difference between the success rate of Two-step and Three-step enrollees in English courses.

Table 4 - English Comparisons Between Two-Step and Three-Step Enrollees

| Group | Observed | Expected | O-E | $(O-E)^2$ | $(O-E)^2/E$ |
|---|---|---|---|---|---|
| Group 2 | 36 | 36.00 | .00 | .00 | .00 |
| Group 3 | 37 | 35.20 | 1.80 | 3.24 | .09 |
| N = 89 (Group 2 = 45, Group 3 = 44) | | | | | .09 |
| | | | | Chi Square = | .09 |

No. 4 Results: Failed to reject the null hypothesis. There is no significant difference between the success rate of Two-step and Three-step enrollees in English courses.

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Null Hypothesis No. 5: There is no significant difference between the success rate of One-step and Multi-step enrollees in Mathematics courses.

Table 5 - Mathematics Comparisons Between One-Step and Multi-Step Enrollees

| Group | Observed | Expected | O-E | $(O-E)^2$ | $(O-E)^2/E$ |
|---|---|---|---|---|---|
| Group 1 | 212 | 181.60 | 30.40 | 924.16 | 5.09 |
| Groups 2&3 | 94 | 106.40 | -12.40 | 153.76 | 1.45 |
| N = 360 (Group 1 = 227, Groups 2 and 3 = 133) | | | | | 6.54 |
| | | | | Chi Square = | 6.54 |

No. 5 Results: The null hypothesis is rejected. There is a significant difference between the success rate of One-step and Multi-step enrollees in Mathematics courses.

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Null Hypothesis No. 6: There is no significant difference between the success rate of One-step and Two-step enrollees in Mathematics courses.

Table 6 - Mathematics Comparisons Between One-Step and Two-Step Enrollees

| Group | Observed | Expected | O-E | $(O-E)^2$ | $(O-E)^2/E$ |
|---|---|---|---|---|---|
| Group 1 | 212 | 181.60 | 30.40 | 924.16 | 5.09 |
| Group 2 | 52 | 54.40 | -2.40 | 5.76 | .11 |
| N = 295 (Group 1 = 227, Group 2 = 68) | | | | | 5.20 |

Chi Square = 5.20

No. 6 Results: The null hypothesis is rejected. There is a significant difference between the success rate of One-step and Two-step enrollees in Mathematics courses.

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Null Hypothesis No. 7: There is no significant difference between the success rate of One-step and Three-step enrollees in Mathematics courses.

Table 7 - Mathematics Comparisons Between One-Step and Three-Step Enrollees

| Group | Observed | Expected | O-E | $(O-E)^2$ | $(O-E)^2/E$ |
|---|---|---|---|---|---|
| Group 1 | 212 | 181.60 | 30.40 | 924.16 | 5.09 |
| Group 3 | 42 | 52.00 | -10.00 | 100.00 | 1.92 |
| N= 292 (Group 1 = 227, Group 2 = 65) | | | | | 7.01 |

Chi Square = 7.01

No. 7 Results: The null hypothesis is rejected. There is a significant difference between the success rate of One-step and Three-step enrollees in Mathematics courses.

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Null Hypothesis No. 8: There is no significant difference between the success rate of Two-step and Three-step enrollees in Mathematics courses.

Table 8 - Mathematics Comparisons Between Two-Step and Three-Step Enrollees

| Group | Observed | Expected | O-E | $(O-E)^2$ | $(O-E)^2/E$ |
|---|---|---|---|---|---|
| Group 2 | 52 | 54.40 | -2.40 | 5.76 | .11 |
| Group 3 | 42 | 52.00 | -10.00 | 100.00 | 1.92 |
| N = 133 (Group 2 = 68, Group 3 = 65) | | | | | 2.03 |

Chi Square = 2.03

No. 8 Results: Failed to reject the null hypothesis. There is no significant difference between the success rate of Two-step and Three-step enrollees in Mathematics courses.

It can be seen in Tables 1, 2, 3, and 4 that all success rate comparisons in English courses failed to show any significant differences. This finding indicates that the success rate of Developmental Studies students compares favorably to the success rate of regular students (One-step enrollees) in English courses.

Mathematics comparisons show a different picture. Regular students have a success rate in Mathematics courses that is significantly different from Developmental Studies students and from Two-Step Enrollees; collectively (Table 5), or individually

(Tables 6 and 7). However, there is no significant difference between the success rate of Two-Step Enrollees and Developmental Studies students in Mathematics courses.

## Conclusions and Recommendations

It is concluded that Special Services Department efforts in Reading and English are providing growth experiences which enable Developmental Studies students to generate success rates comparable to that of regular students. However, English skills for vocational-technical students can hardly be overemphasized. Nationwide, employer criticism of technical institutions are directed less towards the development of technical skills, and more towards the lack of skill development in the written and spoken word. It is recommended that curriculum vigilance and upgrading continue in DeKalb Tech program level English courses to assure that skill development is commensurate with the needs of the work environment.

The success rates were similiar in the English and Mathematics comparisons between Developmental Studies students and Two-Step enrollees. Noted as ar original concern in this study, this finding suggests that the Special Services Department is successful in closing the gap between these two groups in Reading, English, and Mathematics before they enter studies at the program level.

Since regular students had significantly higher success rates than Two-Step enrollees or Developmental Studies students in Mathematics courses, the REM Test is confirmed as a sound predictor of success for program level Mathematics. This finding

emphasizes the difficulty in remediating Mathematics deficiencies, highlights the need for better feedback assessments from program level Mathematics instructors to the Special Services Department, and suggests that further research is needed in developing Mathematics skills. It is recommended that efforts be made to upgrade the level of preparation in Developmental Studies Mathematics, and that more Two-Step enrollees be advised to enroll in Developmental Studies Mathematics before matriculating at the program level. Concurrent enrollment should also be considered.

It is recommended that this study be replicated every three years or at any time period when similar comparisons appear to be needed. This study should be used as a foundation to address more adequately the educational needs of constituents that DeKalb Technical School is bound to serve.

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